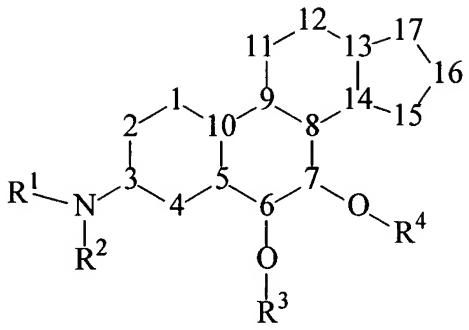
CLAIMS

1. A compound of the formula



and pharmaceutically acceptable salts, solvates, stereoisomers and prodrugs thereof, in isolation or in mixture, where independently at each occurrence:

R^1 and R^2 are selected from hydrogen, oxygen so as to form nitro or oxime, amino, $-SO_3-R$, and organic groups having 1-30 carbons and optionally containing 1-6 heteroatoms selected from nitrogen, oxygen, phosphorous, silicon, and sulfur, where R^2 may be a direct bond to numeral 3, or R^1 and R^2 may, together with the N to which they are both bonded, form a heterocyclic structure that may be part of an organic group having 1-30 carbons and optionally containing 1-6 heteroatoms selected from nitrogen, oxygen and silicon; or R^1 may be a 2 or 3 atom chain to numeral 2 so that $-N-R^1-$ forms part of a fused bicyclic structure to ring A;

R^3 and R^4 are selected from direct bonds to 6 and 7 respectively so as to form carbonyl groups, hydrogen, or a protecting group such that R^3 and/or R^4 is part of hydroxyl or carbonyl protecting group;

numerals 1 through 17 each represent a carbon, where carbons at numerals 1, 2, 4, 11, 12, 15, 16 and 17 may be independently substituted with

(a) one of: $=O$, $=C(R^5)(R^5)$, $=C=C(R^5)(R^5)$, $-C(R^5)(R^5)(C(R^5)(R^5))_n-$ and $-(O(C(R^5)(R^5))_nO)-$ wherein n ranges from 1 to about 6 ; or

(b) two of the following, which are independently selected: -X, $-N(R^1)(R^2)$, $-R^5$ and $-OR^6$;

and where carbons at numerals 5, 8, 9, 10, 13 and 14 may be independently substituted with one of -X, $-R^5$, $-N(R^1)(R^2)$ or $-OR^6$;

in addition to the $-OR^3$ and $-OR^4$ groups as shown, each of carbons 6 and 7 may be independently substituted with one of -X, $-N(R^1)(R^2)$, $-R^5$ or $-OR^6$;

each of rings A, B, C and D is independently fully saturated, partially saturated or fully unsaturated;

R^5 at each occurrence is independently selected from H, X, and C_{1-30} organic moiety that may optionally contain at least one heteroatom selected from the group consisting of boron, halogen, nitrogen, oxygen, silicon and sulfur; where two geminal R^5 groups may together form a ring with the carbon atom to which they are both bonded;

R^6 is H or a protecting group such that $-OR^6$ is a protected hydroxyl group, where vicinal $-OR^6$ groups may together form a cyclic structure that protects vicinal hydroxyl groups, and where geminal $-OR^6$ groups may together form a cyclic structure that protects a carbonyl group; and

X represents fluoride, chloride, bromide and iodide.

2. A compound of claim 1 wherein

numerals 1 through 16 each represent a carbon, where carbons at numerals 1, 2, 4, 11, 12, 15 and16 may be independently substituted with

(a) one of: =O, $=C(R^5)(R^5)$, $=C=C(R^5)(R^5)$, $-C(R^5)(R^5)(C(R^5)(R^5))_n-$ and $-(O(C(R^5)(R^5))_nO)-$ wherein n ranges from 1 to about 6 ; or

(b) two of the following, which are independently selected: -X, $-N(R^1)(R^2)$, $-R^5$ and $-OR^6$; and

numeral 17 represents a carbon substituted with

(a) one of: $=C(R^{5a})(R^{5a})$, $=C=C(R^{5a})(R^{5a})$, and $-C(R^{5a})(R^{5a})(C(R^{5a})(R^{5a}))_n-$ wherein n ranges from 1 to about 6 ; or

(b) two of the following, which are independently selected: -X, $-N(R^1)(R^2)$, and $-R^{5a}$;

where R^{5a} at each occurrence is independently selected from H, X, and C_{1-30} organic moiety that may optionally contain at least one heteroatom selected from the group consisting of boron, halogen, nitrogen, silicon and sulfur; where two geminal R^5 groups may together form a ring with the carbon atom to which they are both bonded.

3. A compound of claim 2 wherein R^{5a} at each occurrence is independently selected from C_{1-30} hydrocarbon, C_{1-30} halocarbon, C_{1-30} hydrohalocarbon, H, and X.

4. A compound of claim 2 wherein R^{5a} at each occurrence is independently selected from C_{1-10} hydrocarbon, C_{1-10} halocarbon, C_{1-10} hydrohalocarbon, H, and X.

5. A compound of any of claims 1-4 wherein R^1 and R^2 are selected from hydrogen, oxygen so as to form nitro or oxime, amino, $-SO_3-R$, and organic groups having 1-30 carbons and optionally containing 1-6 heteroatoms selected from oxygen, phosphorous, silicon, and sulfur, where R^2 may be a direct bond to numeral 3, or R^1 and R^2 may, together with the N to which they are both bonded, form a heterocyclic structure that may be part of an organic group having 1-30 carbons and optionally containing 1-6 heteroatoms selected from oxygen and silicon; or R^1 may be a 2 or 3 atom chain to numeral 2 so that $-N-R^1-$ forms part of a fused bicyclic structure to ring A.

6. A compound of any of claims 1-5 wherein

carbons at numerals 1, 2, 4, 11, 12, 15 and 16 are each substituted with two hydrogens unless said carbon is part of an unsaturated bond;

carbons at numerals 5, 8, 9 and 14 are each substituted with one hydrogen unless said carbon is part of an unsaturated bond;

carbon at numeral 10 is substituted with methyl; and

carbon at number 13 is substituted with methyl unless it is part of an unsaturated bond.

7. A compound of any of claims 1-6 wherein

carbons at numerals 1, 2, 4, 11, 12, 15 and 16 are each substituted with two hydrogens;

carbons at numerals 5, 8, 9 and 14 are each substituted with one hydrogen;

carbon at numeral 10 is substituted with methyl; and

carbon at number 13 is substituted with methyl unless it is part of an unsaturated bond.

8. A compound of claim 1 wherein

R^1 and R^2 are hydrogen;

R^3 and R^4 are selected from direct bonds to 6 and 7 respectively so as to form carbonyl groups, hydrogen, or a protecting group such that R^3 and/or R^4 is part of hydroxyl or carbonyl protecting group; and in addition to the $-OR^3$ and $-OR^4$ groups as shown, each of carbons 6 and 7is substituted with hydrogen unless precluded because $-OR^3$ or $-OR^4$ represent a carbonyl group;

carbons at numerals 1, 2, 4, 11, 12, 15 and 16 are each substituted with two hydrogens unless said carbon is part of an unsaturated bond;

carbons at numerals 5, 8, 9 and 14 are each substituted with one hydrogen unless said carbon is part of an unsaturated bond;

carbon at numeral 10 is substituted with methyl;

carbon at number 13 is substituted with methyl unless it is part of an unsaturated bond;

carbon at numeral 17 is substituted with

(a) one of: =O, $=C(R^5)(R^5)$, $=C=C(R^5)(R^5)$, $-C(R^5)(R^5)(C(R^5)(R^5))_n-$ and $-(O(C(R^5)(R^5))_nO)-$ wherein n ranges from 1 to about 6 ; or

(b) two of the following, which are independently selected: -X, $-N(R^1)(R^2)$, $-R^5$ and $-OR^6$;

each of rings A, B, C and D is independently fully saturated, partially saturated or fully unsaturated;

R^5 at each occurrence is independently selected from H, X, and C_{1-30} organic moiety that may optionally contain at least one heteroatom selected from the group consisting of boron, halogen, nitrogen, oxygen, silicon and sulfur; where two geminal R^5 groups may together form a ring with the carbon atom to which they are both bonded;

R^6 is H or a protecting group such that $-OR^6$ is a protected hydroxyl group, where vicinal $-OR^6$ groups may together form a cyclic structure that protects vicinal hydroxyl groups, and where geminal $-OR^6$ groups may together form a cyclic structure that protects a carbonyl group; and

X represents fluoride, chloride, bromide and iodide.

9. A compound of claim 8 wherein

R^1 and R^2 are hydrogen;

R^3 and R^4 are selected from hydrogen and protecting groups such that R^3 and/or R^4 is part of hydroxyl protecting group;

carbons at numerals 1, 2, 4, 11, 12, 15 and 16 are each substituted with two hydrogens;

carbons at numerals 5, 8, 9 and 14 are each substituted with one hydrogen;

carbon at numeral 10 is substituted with methyl;

carbon at number 13 is substituted with methyl unless it is part of an unsaturated bond;

carbon at numeral 17 is substituted with

(a) one of: $=C(R^5)(R^5)$ and $=C=C(R^5)(R^5)$; or

(b) two of the following, which are independently selected: -X, $-N(R^1)(R^2)$, and $-R^5$;

each of rings A, B, C and D is independently fully saturated or partially saturated;

R^5 at each occurrence is independently selected from H, X, and C_{1-30} hydrocarbons, halocarbons and halohydrocarbons; and

X represents fluoride, chloride, bromide and iodide.

10. A compound of claim 9 wherein

R^1 and R^2 are hydrogen;

R^3 and R^4 are selected from hydrogen and protecting groups such that R^3 and/or R^4 is part of hydroxyl protecting group;

carbons at numerals 1, 2, 4, 11, 12, 15 and 16 are each substituted with two hydrogens;

carbons at numerals 5, 8, 9 and 14 are each substituted with one hydrogen;

carbon at numeral 10 is substituted with methyl;

carbon at number 13 is substituted with methyl unless it is part of an unsaturated bond;

carbon at numeral 17 is substituted with

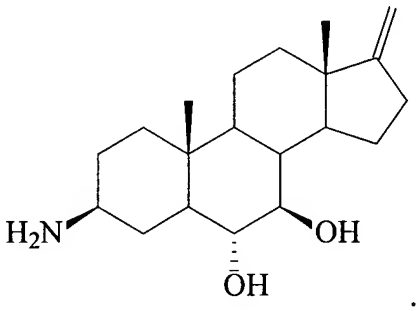
(a) one of: $=C(R^5)(R^5)$; or

(b) two of $-R^5$;

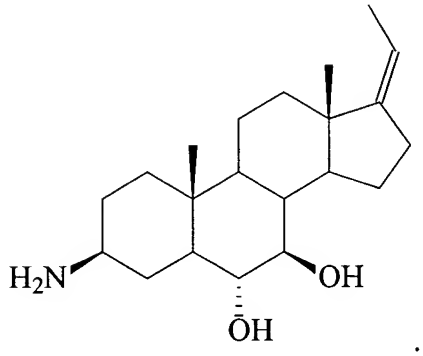
each of rings A, B, C and D is independently fully saturated or partially saturated; and

R^5 at each occurrence is independently selected from H and C_{1-10} hydrocarbons.

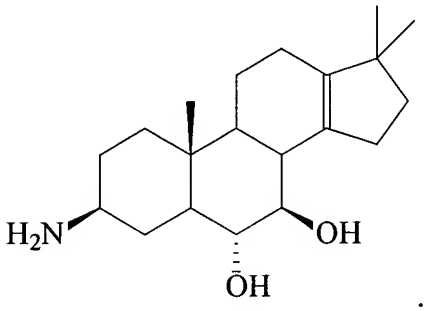
11. A compound of any one of claims 1-10 of the formula



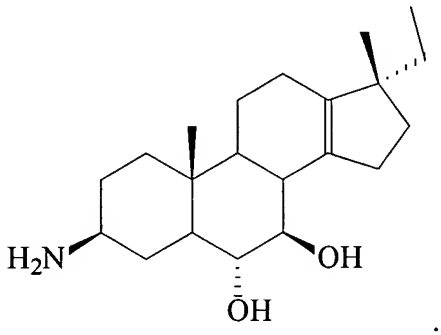
12. A compound of any one of claims 1-10 of the formula



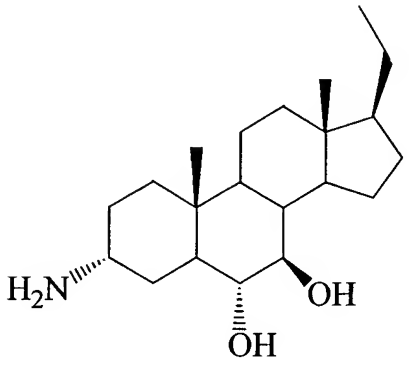
13. A compound of any one of claims 1-10 of the formula



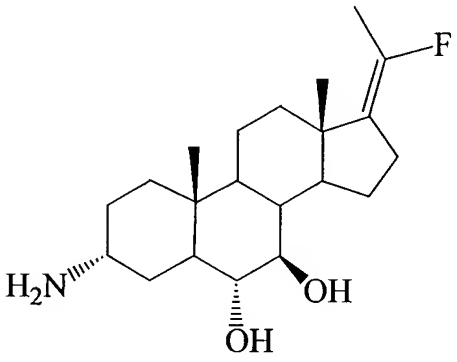
14. A compound of any one of claims 1-10 of the formula



15. A compound of any one of claims 1-10 of the formula



16. A compound of any one of claims 1-10 of the formula



17. A compound of claim 1 wherein 17 is substituted with $=C(R^5)(R^5)$ and R^5 is selected from hydrogen, halogen, C_{1-6}alkyl, C_{1-6} hydroxyalkyl, and $-CO_2-C_{1-6}$alkyl.

18. A compound of claim 1 wherein 17 is substituted with C_{1-6}alkyl or C_{1-6}haloalkyl.

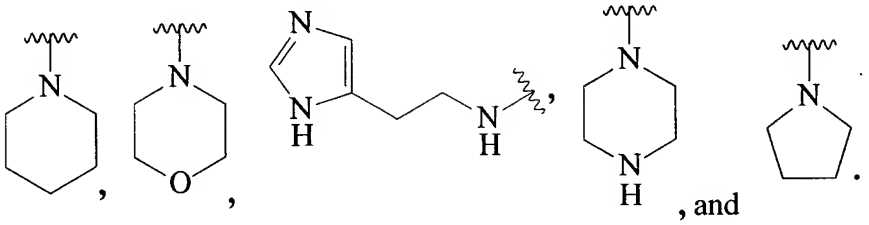
19. A compound of claim 1 wherein 17 is substituted with $-OR^6$ or =O, wherein R^6 is hydrogen.

20. A compound of claim 1 wherein R^1 is selected from $-C(=O)-R^7$, $-C(=O)NH-R^7$; $-SO_2-R^7$; wherein R^7 is selected from alkyl, heteroalkyl, aryl and heteroaryl.

21. A compound of claim 20 wherein R^7 is selected from C_{1-10}hydrocarbyl.

22. A compound of claim 20 wherein R^7 comprises biotin.

23. A compound of claim 1 wherein $(R^1)(R^2)N$- is selected from



, and .

24. A compound of claim 1 wherein R^1 is hydrogen and R^2 comprises a carbocycle.

25. A compound of claim 24 wherein the carbocycle is phenyl.

26. A compound of claim 25 wherein R^2 is selected from 3-methylphenyl; 4-hydroxyphenyl; and 4-sulfonamidephenyl.

27. A compound of claim 1 wherein R^1 is hydrogen and R^2 comprises a C_{1-10}hydrocarbyl.

28. A compound of claim 1 wherein R^1 is hydrogen and R^2 is heteroalkyl.

29. A compound of claim 28 wherein R^2 is selected from C_{1-10}alkyl-W-C_{1-10}alkylene- wherein W is selected from O and NH; HO-C_{1-10}alkylene-; and HO-C_{1-10}alkylene-W-C_{1-10}alkylene- where W is selected from O and NH.

30. A compound of claim 1 wherein R^1 is hydrogen and R^2 is $-CH_2-R^7$ wherein R^7 is selected from alkyl, heteroalkyl, aryl and heteroaryl.

31. A compound of claim 30 wherein R^7 is selected from alkyl-substituted phenyl; halogen-substituted phenyl; alkoxy-substituted phenyl; aryloxy-substituted phenyl; and nitro-substituted phenyl.

32. A compound of claim 1 wherein each of R^1 and R^2 is hydrogen.

33. A compound of claims 1 or 32 wherein each of R^3 and R^4 is hydrogen.

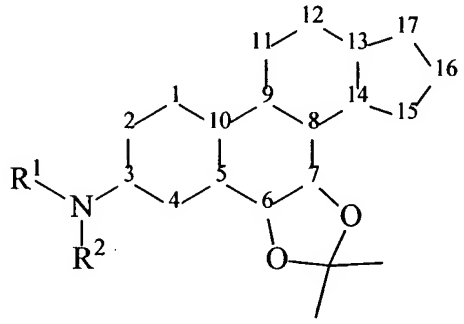
34. A compound of claims 32 or 33 where the carbon at numeral 17 is substituted with

(a) one of the following: $C(R^{5a})(R^{5a})$, $=C=C(R^{5a})(R^{5a})$, and $-C(R^{5a})(R^{5a})(C(R^{5a})(R^{5a}))_n-$ wherein n ranges from 1 to about 6 ; or

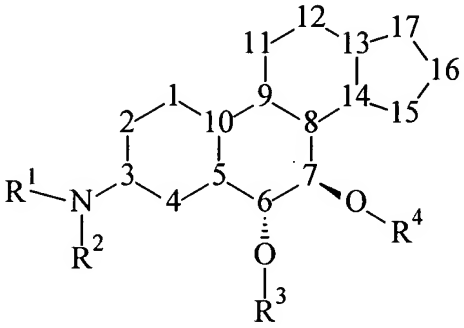
(b) two of the following, which are independently selected: -X, $-N(R^1)(R^2)$, and $-R^{5a}$;

where R^{5a} at each occurrence is independently selected from H, X, and C_{1-30} organic moiety that may optionally contain at least one heteroatom selected from the group consisting of boron, halogen, nitrogen, silicon and sulfur; where two geminal R^5 groups may together form a ring with the carbon atom to which they are both bonded.

35. A compound of claim 1 wherein R^3 and R^4 together form a ketal of the structure



36. A compound of claim 1 wherein $-OR^3$ and $-OR^4$ have the stereochemistry shown



37. A compound of claim 1 wherein $-N(R^1)(R^2)$ is in a salt form.

38. A compound of claim 1 wherein $-N(R^1)(R^2)$ is in a salt form and the salt is a halogen or acetate salt.

39. A compound of claim 1 which is a prodrug of the formula shown in claim 1.

40. A compound of claim 1 and pharmaceutically acceptable salts, solvates, stereoisomers but not prodrugs thereof, in isolation or in mixture.

41. A compound of claim 1 wherein at least one of the carbons at numerals 10 and 13 are substituted with methyl.

42. A compound of claim 1 wherein each of R^1 and R^2 are independently selected from hydrogen and organic groups having 1-20 carbons and optionally containing 1-5 heteroatoms selected from nitrogen, oxygen, silicon, and sulfur.

43. A compound of claim 1 wherein

R^1 and R^2 are independently selected from hydrogen, R^8, R^9, R^{10}, R^{11} and R^{12} where R^8 is selected from alkyl, heteroalkyl, aryl and heteroaryl; R^9 is selected from $(R^8)_r$-alkylene, $(R^8)_r$-heteroalkylene, $(R^8)_r$-arylene and $(R^8)_r$-heteroarylene; R^{10} is selected from $(R^9)_r$-alkylene, $(R^9)_r$-heteroalkylene, $(R^9)_r$-arylene, and $(R^9)_r$-heteroarylene; R^{11} is selected from $(R^{10})_r$-alkylene, $(R^{10})_r$-heteroalkylene, $(R^{10})_r$-arylene, and $(R^{10})_r$-heteroarylene, R^{12} is selected from $(R^{11})_r$-alkylene, $(R^{11})_r$-heteroalkylene, $(R^{11})_r$-arylene, and $(R^{11})_r$-heteroarylene, and r is selected from 0, 1, 2, 3, 4 and 5, with the proviso that R^1 and R^2 may join to a common atom so as to form a ring with the common atom.

44. A compound of claims 1 or 43 wherein

R^3 and R^4 are selected from hydrogen and protecting groups such that R^3 and/or R^4 is part of hydroxyl protecting group;

carbons at numerals 1, 2, 4, 11, 12, 15 and 16 are each substituted with two hydrogens unless said carbon is part of an unsaturated bond;

carbons at numerals 5, 8, 9 and 14 are each substituted with one hydrogen unless said carbon is part of an unsaturated bond;

carbon at numeral 10 is substituted with methyl;

carbon at number 13 is substituted with methyl unless it is part of an unsaturated bond;

carbon at numeral 17 is substituted with

(a) one of: $=C(R^5)(R^5)$ and $=C=C(R^5)(R^5)$; or

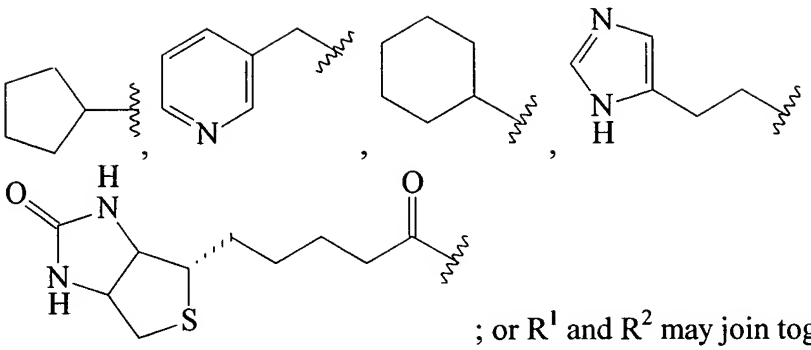
(b) two of -R^5;

each of rings A, B, C and D is independently fully saturated or partially saturated; and

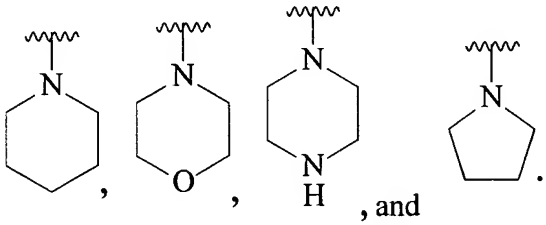
R^5 at each occurrence is independently selected from H and C_{1-10} hydrocarbons.

45. A compound of claims 1, 43 or 44 wherein R^1 and R^2 are independently selected from hydrogen, R^8, R^9, R^{10}, R^{11} and R^{12} where R^8 is selected from C_{1-10}alkyl,C_{1-10}heteroalkyl comprising 1, 2 or 3 heteroatoms, C_{6-10}aryl and C_{3-15}heteroaryl comprising 1, 2 or 3 heteroatoms; R^9 is selected from $(R^8)_r$-C_{1-10}alkylene, $(R^8)_r$-C_{1-10}heteroalkylene comprising 1, 2 or 3 heteroatoms, $(R^8)_r$-C_{6-10}arylene and $(R^8)_r$-C_{3-15}heteroarylene comprising 1, 2 or 3 heteroatoms; R^{10} is selected from $(R^9)_r$-C_{1-10}alkylene, $(R^9)_r$- C_{1-10}heteroalkylene comprising 1, 2 or 3 heteroatoms, $(R^9)_r$-C_{6-10}arylene, and $(R^9)_r$- C_{3-15}heteroarylene comprising 1, 2 or 3 heteroatoms; R^{11} is selected from $(R^{10})_r$-C_{1-10}alkylene, $(R^{10})_r$- C_{1-10}heteroalkylene comprising 1, 2 or 3 heteroatoms, $(R^{10})_r$-C_{6-10}arylene, and $(R^{10})_r$-C_{3-15}heteroarylene comprising 1, 2 or 3 heteroatoms, R^{12} is selected from $(R^{11})_r$-C_{1-10}alkylene, $(R^{11})_r$-C_{1-10}heteroalkylene comprising 1, 2 or 3 heteroatoms, $(R^{11})_r$-C_{6-10}arylene, and $(R^{11})_r$-C_{3-15}heteroarylene comprising 1, 2 or 3 heteroatoms, and r is selected from 0, 1, 2, 3, 4 and 5, with the proviso that R^1 and R^2 may join to a common atom so as to form a ring with the common atom.

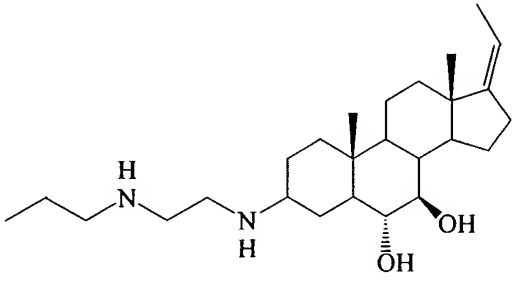
46. A compound of claims 1, 43 or 44 wherein R^1 and R^2 are selected from hydrogen, CH_3-, $CH_3(CH_2)_2$-, $CH_3(CH_2)_4$-, CH_3CO-, C_6H_5CO- $(CH_3)_2CHSO_2$-, $C_6H_5SO_2$-, C_6H_5NHCO-, $CH_3(CH_2)_2NHCO$-, $CH_3(CH_2)_2NH(CH_2)_2$-, $(CH_3)_2N(CH_2)_2$-, $HOCH_2CH_2$-, $HOCH_2(CH_2)_4$-, $HOCH_2CH_2NHCH_2CH_2$-, 3-$(CH_3)C_6H_4$-, 4-$(HO)C_6H_4$-, 4-$(H_2NSO_2)C_6H_4$-, 4-$((CH_3)_2CH)C_6H_4$-CH_2-, 2-$(F)C_6H_4$-CH_2-, 3-$(CF_3)C_6H_4$-CH_2-, 2-$(CH_3O)C_6H_4$-CH_2-, 4-$(CF_3O)C_6H_4$-CH_2-, 3-$(C_6H_5O)C_6H_4$-CH_2-, 3-$(NO_2)C_6H_4$-CH_2-,


and

; or R^1 and R^2 may join together with the nitrogen to which they are both attached and form a heterocycle selected from:


, and .

47. A compound of claims 1 or 43 of the formula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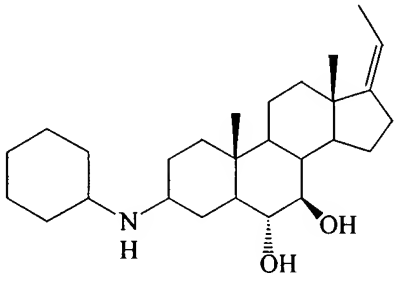
48. A compound of claims 1 or 43 of the formula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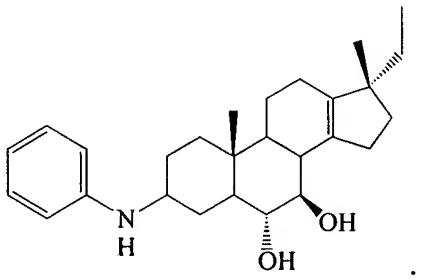
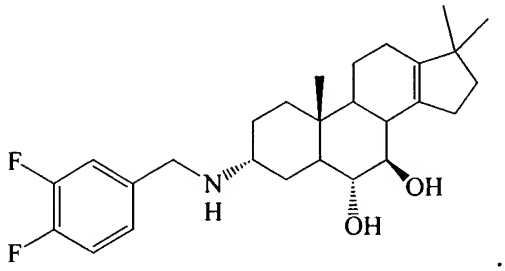
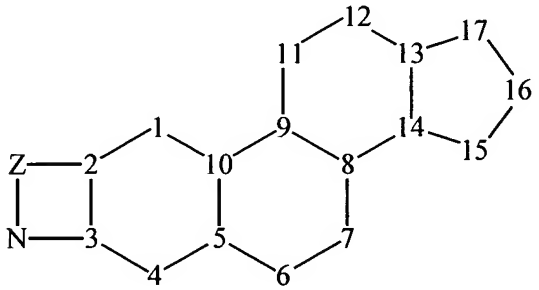
49. A compound of claims 1 or 43 of the formula



50. A compound of claims 1 or 43 of the formula

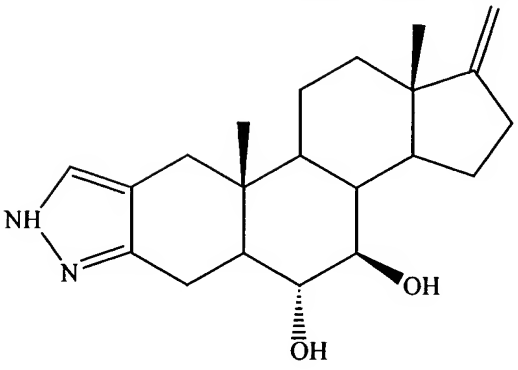


51. A compound of claim 1 wherein R^1 is a 2, or 3 atom chain to numeral 2 so that –N-R^1- forms part of a fused bicyclic structure to ring A, the compound having the formula:

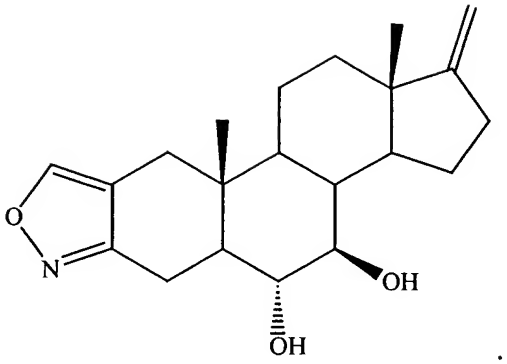


where Z represents 2 or 3 atoms, independently selected from C, N and O so long as a stable structure results, and the ring including Z may be saturated or unsaturated.

52. A compound of claim 51 selected from



and



53. A pharmaceutical composition comprising a compound of any of claims 1-52 and a pharmaceutically acceptable carrier, excipient or diluent.

54. A method of treating inflammation therapeutically comprising administering to a subject in need thereof a therapeutically-effective amount of a compound of any of claims 1-52.

55. A method of treating inflammation prophylactically comprising administering to a subject in need thereof a prophylactically-effective amount of a compound of any of claims 1-52.

56. A method of treating asthma comprising administering to a subject in need thereof a therapeutically-effective amount of a compound of any of claims 1-52.

57. A method of treating allergic disease including but not limited to dermal and ocular indications comprising administering to a subject in need thereof a therapeutically-effective amount of a compound of any of claims 1-52.

58. A method of treating chronic obstructive pulmonary disease comprising administering to a subject in need thereof a therapeutically-effective amount of a compound of any of claims 1-52.

59. A method of treating atopic dermatitis comprising administering to a subject in need thereof a therapeutically-effective amount of a compound of any of claims 1-52.

60. A method of treating solid tumours comprising administering to a subject in need thereof a therapeutically-effective amount of a compound of any of claims 1-52.

61. A method of treating AIDS comprising administering to a subject in need thereof a therapeutically-effective amount of a compound of any of claims 1-52.

62. A method of treating ischemia reperfusion injury comprising administering to a subject in need thereof a therapeutically-effective amount of a compound of any of claims 1-52.

63. A method of treating cardiac arrhythmias comprising administering to a subject in need thereof a therapeutically-effective amount of a compound of any of claims 1-52.